UV DISINFECTION & PLANT REMODELING PROJECT TIMELINE UPDATE

- **September, 2007** (start of project)
- **June, 2008** (underground piping and structures in progress)
- **May, 2009** (start of UV Disinfection at the NW Plant)
- **January, 2010** (completed UV Disinfection at the NW Plant)
- **March, 2010** (completed project)

GL O S S A R Y

**Action level (AL)** The concentration of a contaminant which, if exceeded, requires treatment or other require- ments with a water system must follow.

**Arsenic** A chemical element that is naturally occurring in drinking water and can cause cancer in individuals, and is linked to other health effects such as skin damage and circulatory problems.

**Californium** A radioactive element that is a by-product of nuclear reactions that cause cancer in humans and other animals.

**Contaminant** Any substance or chemical applied to kill or control pests, including weeds, insects, algae, and other household activities. Causes cancer, birth defects, and other health problems to which children are particularly sensitive.

**Detection** The process of identifying the presence of a particular contaminant. Detection of a contaminant does not necessarily mean a particular health risk is present.

**Disinfection** The process of removing or destroying disease-causing agents, so that the probability of their infecting another person is lower. Disinfection is used in many processes, including water treatment, to prevent the spread of disease.

**Filtration** A treatment process that physically removes particles from water, with the probability that the disinfecting agent is present. The process is often used to supply well water.

**Ground water** The supply of fresh water found beneath the earth's surface, usually in aquifers. Groundwater is often used to supply wells and springs.

**Maximum Contaminant Level (MCL)** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible, using the best available science.

**Maximum Contaminant Level Goal (MCLG)** The health-based level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Maximum Residual Disinfection Level (MRDL)** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of disinfectants is necessary for control of microbial contaminants.

**Minimum Residual Disinfection Level (MRDLG)** The lowest level of a disinfecting agent allowed in drinking water. There is convincing evidence that addition of disinfectants is necessary for control of microbial contaminants.

**Radionuclides** Any substance or chemical applied to kill or control pests, including weeds, insects, algae, and other household activities. Causes cancer, birth defects, and other health problems to which children are particularly sensitive.

**Salmonella** A group of bacteria that cause food poisoning.

**Source water** Any water that is directly or indirectly used for drinking water supply. Source water quality is one of the most important factors in ensuring the safety of drinking water.

**Surface water** Water naturally exposed to the environment and where human activities directly influence water quality. Source water for drinking water systems is usually derived from surface water.

**Visibility** Ability of a water body to support fish and other aquatic life. This parameter is used to determine the level of contamination in drinking water.

**Volatile organic compounds (VOCs)** A group of contaminants regulated by the federal government that are present in regular household contaminants and could also be considered a violation.
The City of Cedar Rapids obtains its drinking water supplies from shallow vertical and collector wells constructed in the sand and gravel deposits along the Cedar River. These deposits form an underground bearing-layer called an alluvial aquifer. Because of continuous pumping of the City’s wells, most of the water in the aquifer is pulled from the river. The rest of the water is supplied as water percolates up from a deeper bedrock aquifer or down from the top of the ground.

Our drinking water from those wells benefits from natural filtration through the riverbank. This natural and sediment treatment has proven beneficial, pre-treating the water before it ever reaches the City’s two treatment plants (both conventional lime-softerning facilities). In order to most effectively manage our water resources, the Cedar Rapids Water Department (CRWD) has worked with state and federal agencies to complete a source water assessment, identifying potential contaminant sources in the Cedar River watershed. The results of that assessment, paired with a continuous monitoring program, help us better understand our watershed.

We have confirmed that some contaminants, including nitrate, herbicides and bacteria, enter the Cedar River watershed upstream from our wells. The watershed of the Cedar River upstream of Cedar Rapids is over 6,500 square miles and extends into southern Minnesota. This information is helpful when making decisions about current and future operational and water treatment needs.

Through those studies, we have confirmed the need for continued monitoring and for a strong watershed protection program. If you are interested in reviewing our source water assessment or any monitoring results, please contact the CRWD at 319-286-9918.

TREATMENT PROCESS HIGHLIGHTS

Recarbonation and chlorination. The CRWD lowers water pH by adding carbon dioxide and adds chlorine to disinfect the water. The chlorine helps ensure our water’s microbiological safety by killing disease-causing organisms. The Department also adds a trace amount of ammonia to complete the disinfection process.

Filtration. Water is then passed through a sand and gravel filter bed, removing any remaining suspended solids.

Fluoridation & phosphate addition. After filtration, the CRWD adds fluoride to promote children’s dental health. Phosphorus is also added to chemically stabilize the water and lessen the possibility that lead will leach out of pipes over an unhydrated bed of color. Resulting lime material is removed and applied to farmland as soil conditioner.

Distribution. From here, finished water is pumped directly into the three principal water distribution systems that serve businesses and households throughout the City.

Reserves. Water not immediately consumed goes into storage tanks for use when demand exceeds pipe pumping. Water stored in elevated tanks helps to stabilize pressure in the distribution system and serves as an emergency reserve for fire protection.

W A T E R Q U A L I T Y  F I N D I N G S

This table summarizes required water quality monitoring results for regulated parameters that were detected in the 2008 calendar year. The Department of Natural Resources monitors the effectiveness of the City’s water-filtration process and determines whether the water meets federal and state regulatory standards.

The table includes the following parameters:

- 
- Physico-chemical parameters (e.g., turbidity, pH, copper, chloride, fluoride, etc.)
- 
- Biological parameters (e.g., fecal coliforms, enterococci, etc.)
- 
- Radioactive parameters (e.g., radium-226, radium-228, etc.)
- 
- Organochlorine pesticides (e.g., DDT, DDE, etc.)
- 
- Non-impact parameters (e.g., sodium, calcium, magnesium, etc.)

The table reflects 2007 collection data, 2008 data not available because of flooding.

W A T E R  Q U A L I T Y  F I N D I N G S

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Source of</th>
<th>Parameter</th>
<th>Units</th>
<th>Max</th>
<th>Range</th>
<th>Average</th>
<th>Violation</th>
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<th>% of samples</th>
<th>Action Level</th>
<th>Contaminant</th>
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<tr>
<td>Copper*</td>
<td>µg/L</td>
<td>1.3</td>
<td>1.3</td>
<td>ND</td>
<td>ND</td>
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<td>No</td>
<td>0.05</td>
<td>0.07</td>
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<td>Lead*</td>
<td>µg/L</td>
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<td>0.26</td>
<td>ND</td>
<td>ND</td>
<td>6/12</td>
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<td>7</td>
<td>4.4</td>
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<td>Acids (HAA5)</td>
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<td>Trihalomethanes</td>
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<td>Acidity</td>
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<td>Dissolved Solids</td>
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<td>Phosphate</td>
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</table>

Following is an important message from the Environmental Protection Agency:

D iinking water, including bottled water, may reasonably be expected to contain at least minute amounts of some contaminants. That is because water source water—from lakes, rivers, streams, ponds, reservoirs, springs, and wells—travels over the surface of the land or through the ground, it picks up naturally occurring minerals and, in some cases, radioactive material. It can also pick up substances resulting from the presence of animals or from human activity.

The presence of contaminants does not mean that water poses a health risk. More than 1 billion Americans drink water that may contain contaminants. The EPA has established drinking water standards to protect public health and potential health effects can be obtained by calling the State’s Safe Drinking Water Hotline at 1-800-426-4791 or visiting the website at www.epa.gov/safewater. Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms like fever, diarrhea, cramps, stomach pain, and headache.